

## **Utility model**

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### Dispensers for single-dose dispensing of tablets

The invention relates to dispensers for single-dose dispensing of tablets with a reservoir and a dispensing device which is movable within a stroke limit, where a dispensing chute is connected to the reservoir on the dispensing side and the dispensing slider movable in the said chute has a guide section.

It is known, for example from US patent 4 402 425, to integrate the reservoir in the dispensing mechanism, i.e. the dispensing device contains parts of the separating mechanism and of the reservoir.

The indication to fit a dispensing device, working independently of the reservoir, to said reservoir by screwing already exists in US patent 2 683 554. For this purpose the container takes on an inverted basic position; the container opening points downwards. In the head of this dispensing device there is a dispensing slider which is movable sideways. Said slider has a division chamber which can be moved into a congruent position to a tablet passage opening by displacement of the dispensing slider against the force of a recuperating spring.

Finally, the suggestion exists from the Australian patent application 67 148/74 to empty the reservoir, which is also in an inverted arrangement with the dispensing device, through a dispensing channel which is purely axially orientated. For this purpose a correspondingly axially orientated dispensing chute is connected to the reservoir on the dispensing side, and the dispensing slider which is movable within the said chute extends into a guide section. The latter is hood-like and overlaps an essentially cylindrical casing wall of an insert part of the dispensing device. The separation takes place there by spring fingers which can be spread by means of the

dispensing slider and which normally hold the contents back. In a front end of the dispensing slider forming a separation chamber there is only room for one tablet. However, to release this tablet the whole dispensing slider has to be withdrawn from the insert part. In practice there is little acceptance for this dismantling of parts.

The task of the present invention is to design a dispenser described in the generic part with manufacturing and operational advantages in such a way that, retaining the advantage of using a packaging body as the reservoir, it can even take on an additional function which facilitates operation; good axial guidance should be achieved for the dispensing slider, without having to release the dispensing slider from the dispensing mechanism in order to release and present the tablet.

This task is resolved by the invention stated in claim 1.

The sub-claims are advantageous further developments of the dispenser according to the invention.

By means of this design, a generic dispenser with increased use value is achieved : in spite of using conventional reservoirs, there is perfect handling. This is due to the surprisingly good guidance of the moving parts and in the sensible utilisation of the features of such reservoirs. Specifically, the reservoir is designed as a glass body, with a tapered neck area transferring into the dispensing chute, and the cylindrically formed guide section is orientated in its diameter to the external diameter of the reservoir, which with its also cylindrical section of a larger diameter serves as a guide for the dispensing slider when the dispenser is operated. The base of the inverted glass body acts as the push-button. At the same time it serves as a "glass dome". As a result, the user can monitor the contents very well and ensure that it is completely empty. For perfect guiding the very favourable friction coefficients of the glass material are utilised. This also applies to the advantageous dropping of the tablets in the tapered neck. There can no longer be a tablet blockage due to arching. This means that the dispenser is also more reliable to use. It is also advantageous for the dispensing device to be secured to the outer wall of the tapered neck area of the reservoir, using the area resulting from the tapering in relation to the cylindrical guide section. There is no thickening there; the maximum diameter of the glass container is

only exceeded by the ring wall-like guide section of the dispensing device. Due to the cylindrical shape, a really thin wall thickness is sufficient. On the other hand, the radial coating, even though slight, provides a slightly enlarged standing base for the dispenser which is designed to stand up. It is also favourable that the dispensing device has a screw part for a screw connection to the neck area of the reservoir. This not only results in an advantageous tightness, which is maintained over long periods of use, but also provides the user with a way of changing the container. For such an operation, the guide section and the cylindrical section of the reservoir are easy to grip. On the other hand the dispensing mechanism is not however subjected to the corresponding screw forces if outwards directed guide ribs are formed on the screw part, running in guide grooves of the guide section. The screw part is secured against turning and like a sliding carriage. The glass body is given another function : it is the screw turning handle. Advantageously corresponding longitudinally directed guide ribs and guide grooves lie in an equilateral triangle arrangement. Such guide means can easily be incorporated by injection moulding techniques. They also have a stabilising effect on the guiding and guided part. In addition one feature of the invention consists of the fact that in the dispensing direction<sup>1</sup> a known movable part and a fixed part come together to form a circular surface in top view. The two parts form a filling of the inside of the neck area interrupted only by the dispensing chute. Taking into account the axial movability a cylindrical design is usefully realised. The spatial separation between the movable part and the fixed part leads to a vertically orientated partition line proportionally for the two parts, taking into account the creation of the dispensing chute, in a Z-shaped design, and symmetrically to a diameter, for instance a diametral. In this connection it is also favourable for the arm of the Z to extend in parallel to the diameter and for the cross-piece of the Z to run vertical to it. In the plane of this Z shape the separation profile tailored to the tablet shape to be dispensed can be created in a proportionally balanced way. It also proves useful for the screw part to form a spring support for housing a recuperating spring, so that when not being operated the dispensing device is always automatically in the closed position. Accordingly the other end of the recuperating spring rests on the movable part. Finally, the invention also suggests that the support on the fixed part is

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<sup>1</sup> Translator's note : The German text says "direction" (=Richtung), but this is possibly a typing error for "device" (=Vorrichtung).

formed by a partition of this part forming the tablet passage opening. Such a partition provides a hygienic seal and gives the guide section a high level of inner stability.

The subject-matter of the invention is explained in more detail below on the basis of a diagrammatically represented embodiment.

Fig. 1 shows the dispenser designed according to the invention in basic position, in partial vertical cross-section,

Fig. 2 shows this dispenser in the same view, but releasing the last tablet on the dispensing side,

Fig. 3 shows the cut according to III-III in Fig. 1,

Fig. 4 shows the cut according to line IV-IV in fig. 1,

Fig. 5 shows the partial cut according to line V-V in fig. 1,

Fig. 6 shows the partial cut according to line VI-VI in fig. 1 and

Fig. 7 shows the dispenser in bottom view.

The dispenser Sp represented consists of a dispensing device V and a reservoir B.

Regarding the reservoir B this is a glass vial, referred to throughout as a glass body. In practice it can be a commercial vial made of clear or coloured glass. The predominantly cylindrical section of the glass body continues over a narrowing shoulder 1 into an also cylindrical neck area 2. The clear diameter of the latter corresponds to about half the clear diameter of the glass body. The length ratio of the neck area 2 to the cylindrical section is approx. 1 : 2. The wall thickness of the glass body is practically the same all over. It is usefully produced by blow-moulding.

In the condition of the dispensing device V the glass body takes up an inverted position, i.e. the neck area 2 points in the direction of a horizontal standing surface 3 (cf. Fig. 1).

The surface of the neck area 2 has an outer thread 4. This works together with a screw part 6 of the dispensing device V having a corresponding inner thread 5.

The dispensing device V is made of PP. Apart from a recuperating spring 7 made of metal here, it is in only two parts. If the said recuperating spring 7 is formed on one or other of the two parts, then there is a true single-material dispenser device.

The movable part is marked I and has a dispensing slider 8. This dispensing slider 8 is a part protruding in the dispensing direction from the centrally pierced cover of the screw part 6. It forms one half of an essentially axially orientated dispensing chute 9 of the dispensing device V. The other half of the said dispensing chute 9 is contributed in profile by a second fixed part II. The two chute-forming parts I and II protrude partially with a stopper-like partial section into the inside 10 of the neck area 2. Finally they leave only a clear cross-section corresponding to the maximum cross-section profile of a tablet T.

As can be seen from Fig. 4, the parts I and II come together inside the neck opening, i.e. inside 10, to form a circular surface.

The tablet T is a disk-shaped body, which can if necessary have a slight convex curve on the broad side, leading roughly to a lens shape.

The fixed part marked II is described as fixed because, as regards the proportion of surface on the surface area, it is larger than the surface area section of the glass body protruding when the dispenser Sp is in the basic position. The user will hold the dispenser Sp, shown in the drawings somewhat enlarged, on the overlapping part and use the base of the glass body running obliquely to the longitudinal middle axis x-x of the dispenser as the pressure operating surface 11. This is practical and well accepted. The base has a concave curve increasing in the centre; also the edge runs into the cylindrical surface area of the reservoir B over a rounded area 12. This gives a button which is pleasant to operate.

The overlapping interlocking of the reservoir and the dispensing device V can clearly be seen from the vertical cuts of the drawing. It can also be seen that the fixed part II forms a ring wall-like, cylindrical guide section 13 of the reservoir B. The clear diameter D of the guide section 13 (cf. Fig. 1) is orientated on the outer diameter d of the reservoir B. Thus with its larger diameter but also cylindrical section the reservoir

is guided safely, which at the same time is positive, i.e. favourable, for the dispensing slider 8 when the dispenser Sp is operated. The good sliding property of the glass is utilised here. Between the clear diameter D of the sheath-like ring wall 14 of the guide section 13 and the outer diameter d there is only a small annular gap y, represented rather oversized. This is the best way of compensating for the possibly exposed seam joints which cannot be avoided in blown containers.

But the tapered neck area 2 also has a radial support ensuring axially. However, here the two parts I and II are directly involved, and it was assumed that, due to the screw restriction of the neck area 2 in the screw part, there is a fixing of that end of the glass body which is not only tight but also wobble-free. The corresponding guide means are advantageously housed there in a rotation-symmetrical area under the shoulder 1 created by the recess 15. Thus there is no enlargement of the cross-section of the dispenser Sp, apart from the ring wall 14 of the guide section 13 which should be kept very thin.

Specifically the guide means are achieved by forming outwards-pointing, longitudinally orientated guide ribs 17 on the screw part 6. These engage in guide grooves 18 of the guide section 13 which are also longitudinally orientated. These guide grooves 18 are surrounded by longitudinal strips 19 arranged in pairs. They are rooted in the inner wall of the ring wall 14 of the guide section 13. Their upper inner corners are chamfered or convexly rounded at 20. Below, i.e. on the dispensing side, the longitudinal strips 19 are connected to a partition 21. The length of the guide grooves 18 takes into account the axial stroke of the dispensing slider. This stroke is a little more than the diameter of a tablet T. As regards the dispensing mechanism and the profile of the dispensing chute in relation to the separation of the tablet T, reference is made to the subject-matter of the European patent application 0 345 413, which is incorporated here in full. Therefore an explanation is only needed below in relation to the decisive separation features. These are a separation chamber A, corresponding to the form or broad surface of a tablet A, at the lower end of the dispensing slider 8 protruding over the partition 21, and a separating finger 22 of the fixed part II lying opposite this end. When dispensing is operated (fig. 2), the separating finger 22 lies in front of and blocks a retaining edge 23 above the separation chamber A of the dispensing slider 8. A narrowing occurs here, which is

considerably smaller than the diameter of the tablet T ready to be dispensed; all the other tablets are held back in a hopper-like area of the dispensing chute 9.

However, a further development in relation to the said European application lies in the fact that the broader zone or extension of the dispensing chute 9 extends practically in the largest diameter or in the diametral z-z of the dispenser with rotation-symmetrical shape. The proportional chute formation provides a partition line 24 between parts I and II, which runs in a Z shape and symmetrical to this diameter or this diameter plane (cf. fig. 4). The partition line 24 allows guide or support sections to develop to the cylindrical inner wall of the inside 10, of equal size for the two parts.

The arms of the Z-shaped partition run parallel to the diameter or the diametral z-z. The cross-piece of the Z runs in the diametrals lying obliquely to the diametral z-z, and thus takes the shortest route into the arms of the Z.

The blocking basic position of the dispenser, as already indicated above, is under stress from a recuperating spring 7. In the example embodiment this is used as a separate component. One of its spring supports is formed by the downwards-pointing top of the cover of the screw part 6. It is a screw-shaped compression spring which with its end thread is centred in an annular channel 25 provided by injection moulding at the same time, concentric to the "stopper". The pressure plane lies at the level of the downwards-pointing front edge of the neck area 2. In this way an advantageously sealing pressure of the cover of the screw part 6 is achieved beyond the screw arrangement. The other spring support is on the upper side of the partition 21. There too there is an annular channel, whereby the recuperating spring 7 is also centred. This means that there can be no friction between the clear spring cavity and the periphery of the inner section of parts I and II.

The partition 21 forming the lower spring support forms a passage opening 27 which can clearly be seen in fig. 7, as the bottom guide for the dispensing slider 8. Both parts are formed according to the contour. The guide slot is represented in exaggerated form and even forms a tight seal, so that no fragments can trickle out, except during operation.

Beyond the partition 21 the ring wall 14 of the guide section 13 continues in the same plane into a surrounding control edge 28. Its axial length is a little bigger than the travel of the dispensing slider 8 which is movable within the limit of the stroke.

The two parts I and II which form the dosing device are held together by a stop lug 29 which goes under the tablet passage opening 27 (cf. figs. 1 and 5).

Operation is as follows :

The reservoir B as available commercially, for example, is connected by screwing to the dispensing device V and turned on its head. The dispenser is then ready to use.

Due to the necking of the reservoir B, this moves practically self-centring into the area of the screw part 6. This does not turn with it due to the block by the guide ribs 17/guide grooves 18 arranged at the same angle. This results externally in an overlap by the exposed part, i.e. the ring wall 14. As a result of activation of the pressure operation surface 11, formed by the base of the glass body, the dispensing stroke is achieved with compression of the recuperating spring 7. The separated tablet T falls out (cf. fig. 1). If the user releases the glass body which acts as a push-button, it returns to its base position shown in fig. 1. The next tablet T falls into the separation chamber A in the position ready for dispensing.

A full dispenser Sp does not roll off the table because the contents heaped de-centrally act as a brake. A polygonal glass body section with equal sides is also regarded as cylindrical within the meaning of the invention.

The features of the invention disclosed in the description, the drawing and the claims can be used individually or in any combination to realise the invention. All the features disclosed are essential to the invention. In the disclosure of the application, the disclosure content of the related/enclosed priority documents (copy of the prior application) is also incorporated in full.



## Claims

1. Dispenser (Sp) for single-dose dispensing of tablets (T) with a reservoir (B) and a dispensing device (V) which is movable within a stroke limit, where a dispensing chute (9) is connected to the reservoir (B) on the dispensing side and the dispensing slider (8) movable in the said chute has a guide section (13), characterised in that the reservoir (B) is in the form of a glass body, with a tapered neck area (2) transferring into the dispensing chute (9) and the cylindrically formed guide section (13) is orientated in its clear diameter (D) to the external diameter (d) of the reservoir (B), which with its also cylindrical section of a larger diameter serves as a guide for the dispensing slider (8) when the dispenser (Sp) is operated.
2. Dispenser according to or in particular according to claim 1, characterised in that the dispenser device (V) is secured to the outer wall of the tapered neck area (2) of the reservoir (B), using the area resulting from the recess (15) in relation to the cylindrical guide section (14)<sup>2</sup>.
3. Dispenser according to or in particular according to one or more of the above claims, characterised in that the dispenser device (V) has a screw part (6) for a screw connection with the neck area (2).
4. Dispenser according to or in particular according to one or more of the above claims, characterised in that outwards directed guide ribs (17) are formed on the screw part (6), running in guide grooves (18) of the guide section (13) to move it.
5. Dispenser according to or in particular according to one or more of the above claims, characterised in that in the dispensing device (V) a known movable part (I) and a fixed part (II) come together to form a circular surface in top view (cf. Fig. 4).

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<sup>2</sup> Translator's note : this should be (13).

6. Dispenser according to or in particular according to one or more of the above claims, characterised in that a vertical partition line (24) runs between the two parts (I, II), in a Z shape and symmetrical to a diameter (diametral z-z).
7. Dispenser according to or in particular according to one or more of the above claims, characterised in that the arm of the Z extends in parallel to the diameter (diametral z-z) and the cross-piece of the Z runs vertical to it.
8. Dispenser according to or in particular according to one or more of the above claims, characterised in that the screw part (6) forms a spring support to house a recuperating spring (7).
9. Dispenser according to or in particular according to one or more of the above claims, characterised in that the recuperating spring (7) is supported at the other end on the movable part (II).
10. Dispenser according to or in particular according to one or more of the above claims, characterised in that the support on the fixed part (II) is formed by a partition (21) of this part which forms the tablet passage opening (27).